

A New Species of *Monophyllaea* (Gesneriaceae) from Borneo

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Abstract

Monophyllaea burtiana Kiew is described from Sabah, Malaysia.

Introduction

Since Burt's 1978 monograph on the genus, which described 32 species from Malesia, a further three species have been described from Peninsular Malaysia (Weber, 1998). There are undoubtedly more species to be discovered in remote parts of the region. *Monophyllaea burtiana* Kiew (described below) is the second species to be recorded from Sabah.

Monophyllaea in Sabah

Unlike Sarawak, where there is a wealth of *Monophyllaea* species (14 species), until now only one species, the widespread *M. merrilliana* Kraenzl. was recorded from Sabah. Indeed, while in Sarawak monophyllaeas are a characteristic feature of limestone hills, Sabah is in marked contrast with all except two of the 60 odd hills being devoid of them. *M. merrilliana* only occurs on limestone in the Tabin Wildlife Sanctuary in eastern Sabah, where it does not grow on cliff faces but instead on and among the scattered limestone boulders in the damp, deep shade around the hill (Kiew, 2001). In Sabah, it is more common and has been collected from non-limestone substrates, e.g. from Gunung Kinabalu, Gunung Trusmadi and the Danum Valley.

In contrast to *Monophyllaea merrilliana*, this new species covers a vertical limestone cliff face of the unique below-ground, bowl-shaped gorge at Batu Urun. It is immediately distinguished from *M. merrilliana* by its uniseriate (not branched) hairs and unbranched inflorescences although it does belong to the same subgenus *Moultonia* in possessing anchor-shaped placentas and non-valvate fruits.

Among the species in subgen. *Moultonia*, most of which occur in

Borneo, it keys out with *M. glauca* C.B. Clarke in having unbranched inflorescences at the base of the midrib and a short way up it, in having unbranched hairs, and in the fruit where the style is not exerted beyond the calyx. It is distinct from this species in its shorter peduncle (up to 11 cm long as opposed to 15–25 cm long in *M. glauca*), which is three times longer than the flowering part (as opposed to only a fifth or less in *M. glauca*), as well as its longer calyx, glabrous corolla lobes, larger anthers, and leaf base that is only slightly cordate.

Observations in the field show that the differences between the two subgenera are strongly correlated with seed dispersal. As Burt (1978) pointed out, the fruit of subgen. *Monophyllaea* with long pedicels and four valves are censer fruits where the seeds are dispersed when shaken out by wind or other means. On the other hand, the fruits of subgen. *Moultonia* are typical splash cups, a mode of dispersal common to many other species of rainforest understorey herbs (Kiew, 1988), such as species of *Argostemma* (Rubiaceae), *Epithema* (Gesneriaceae), *Phyllagathis* and *Sonerila* (Melastomataceae), in having short erect pedicels, calyx lobes that open to about 45° and the top of the pericarp that falls off to expose the minute seeds in the splash cup. In this new species, the style base is inflated and hollow and breaks down to expose the seeds. The ballistic force of large water drops dripping through the canopy can bounce the seeds several meters from the parent plant (Savile and Hayhoe, 1978). When dispersal does not occur, the seeds germinate within the open splash cup.

Monophyllaea burtiana* Kiew, *sp. nov.

A *Monophyllaea glauca* C.B. Clarke inflorescentibus brevioribus, ad 11 cm tantum (nec 15–25 cm), corollae lobis glabris et folio non nisi leviter cordato differt.

Type: Borneo: Sabah – Pensiangan District, Batu Urun (lat 4° 48' N long 116° 38' E) J.J. Vermeulen 2100 16 Feb 2001 (holo SING, iso E, L, SAN).

Stem fleshy, up to 35 cm long (not encrusted). *Leaf* pendent, c. 22–23 cm long but much decomposed at the tip, broadly ovate and up to 26 cm wide or broadly oval and c. 22 cm wide, base slightly cordate, thin, slightly rough and densely hairy above, less hairy beneath, hairs uniseriate c. 1 mm long and raised on a hemispherical base, veins plane above, slightly raised beneath. *Inflorescences* arising from the base of the midrib and c. 3.5 cm up the midrib, unbranched with green peduncle (2.5–)11 cm long, densely pilose with uniseriate glandular hairs, flowering part scorpioid with c. 4 rows of flowers, upto 4.5 cm long, not persistent; bract pair reflexed c. 3 x 2

mm; pedicel pilose, erect, 3—5 mm long. *Calyx* c. 8 mm long, deep purple or purple brown, densely pilose outside, tube c. 1.5 mm long, lobes isomorphic, apex acute. *Corolla* c. 9 mm long, 4 mm wide, white with green upper lobes and yellow patch in the throat, tube c. 4.5 mm long with a ring of sparse hairs inside about midway up the tube, hairs extending towards upper lobes, lobes glabrous, upper lobes strongly reflexed, c. 3.5 x 3.5 mm, lateral and median lobes isomorphic, c. 4.5 x 3.5 mm. *Stamens* with green filaments, both pairs arising c. 2.5 mm from base of corolla tube, anterior c. 3 mm long and curved, posterior c. 1.5 mm and straight, anthers yellow, c. 1 mm diam., connate and filling the mouth of the corolla tube. *Disc* c. 0.5 mm high. *Ovary* c. 1 mm long, glabrous; style c. 2 mm long, placentas anchor-shaped in TS. Calyx closes over ovary after pollination, opening with lobes at 30° on fruit maturity and forming a splash cup. Pedicel lengthening to 11 mm. *Fruit* globose, c. 1.5 x 1.25 mm, pericarp thin topped by hollow inflated style base, style c. 2.5 mm long enclosed in the calyx in developing fruit, caducous in mature fruit. *Seeds* many, ellipsoid, tiny c. 0.3 mm long, smooth and jet black.

Distribution: Endemic to Sabah, Borneo, known only from Batu Urun.

Habitat: Deeply shaded limestone cliff face at c. 600 m altitude.

Notes: This species is extremely local being known from a single population that covers a rock face measuring about 20 by 15 m.

The species is named for B.L. Burtt, who for a life-time has worked assiduously on the genus and the family and been an inspiration to others.

Other specimens examined: Lamb B85 (E), Kiew RK 4444 20 May 1997 (SAN, SING).

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References

- Burtt, B.L. 1978. Studies in the Gesneriaceae of the Old World. XLV: A preliminary revision of *Monophyllaea*. *Notes Royal Botanic Garden Edinburgh*. **37**: 1–59.
- Kiew, R. 1988. Herbaceous flowering plants. In: (ed.) E. Cranbrook. *Key Environments: Malaysia*. pp. 56–76.
- Kiew, R. 2001. Towards a limestone flora of Sabah. *Malayan Nature Journal*. **55**: 77–93.
- Savile, D.B.O. and H.N. Hayhoe. 1978. The potential effect of drop size on efficiency of splash-cup and springboard dispersal devices. *Canadian Journal Botany*. **56**: 127–128.
- Weber, A. '1997' published 1998. New taxa of *Monophyllaea* (Gesneriaceae) from Peninsular Malaysia. *Beitraege Biologie Pflanzen*. **70**: 405–406.